

CLAIMS

1. A pedestrian navigation device for navigating the route of a pedestrian, comprising:

position information reception means for obtaining  
5 current position information;

position information analysis means for analyzing said current position information received by the said position information reception means and calculating the current position;

10 map information storage means for storing map information;

central processing means for calculating current position display information, based on said current position calculated by said position information  
15 analysis means, and on said map information stored by said map information storage means; and,

display means for displaying said current position display information calculated by said central processing means; and characterized in that

20 said central processing means has pedestrian history information comprising a reference direction  $\alpha$  indicating the direction of a past movement route and a reference distance  $\beta$  indicating a prescribed distance, takes the current position at the start of navigation to  
25 be reference point  $a_0$ , and, upon receiving the current position  $a_i$  after a prescribed time from said position information analysis means, calculates the distance

La0ai between said reference point a0 and said current position ai, and when

$$\beta > La0ai \quad (1)$$

corrects said current position ai in the direction of said reference direction  $\alpha$  and calculates current position display information, but when

$$\beta \leq La0ai \quad (2)$$

corrects said current position ai in the direction of said reference direction  $\alpha$  and calculates current position display information, and in addition takes the corrected position of said current position ai to be the new reference point, and takes the direction from the previous reference point a0 to the new reference point to be the new reference direction  $\alpha$ .

2. A pedestrian navigation device for navigating the route of a pedestrian, comprising:

position information reception means for obtaining current position information;

position information analysis means for analyzing said current position information received by the said position information reception means and calculating the current position;

map information storage means for storing map information;

central processing means for calculating current position display information, based on said current position calculated by said position information

analysis means, and on said map information stored by said map information storage means; and,

display means for displaying said current position display information calculated by said central

5 processing means; and characterized in that

said central processing means receives the current position  $a_i$  from said position information analysis means at prescribed intervals, and when the absolute value of the difference between the direction angle  $A_i$  from the preceding current position  $a_{i-1}$  to the present  
10 current position  $a_i$  and the reference angle  $A$  is such that

$$\alpha_0 \text{ (tolerance angle)} \geq |A - A_i| \quad (3)$$

calculates current position display information  
15 from said current position  $a_i$ , and takes the direction angle  $A_i$  to be the new reference angle  $A$ .

3. A pedestrian navigation device for navigating the route of a pedestrian, comprising:

position information reception means for obtaining  
20 current position information;

position information analysis means for analyzing said current position information received by the said position information reception means and calculating the current position;

25 map information storage means for storing map information;

central processing means for calculating current position display information, based on said current position calculated by said position information analysis means, and on said map information stored by  
5 said map information storage means; and,

display means for displaying said current position display information calculated by said central processing means; and characterized in that

said central processing means takes the current  
10 position at the start of navigation to be the reference point  $a_0$ , receives the current position  $a_i$  at prescribed intervals from said position information analysis means, calculates the distance  $La_{0ai}$  between said reference point  $a_0$  and the current position  $a_i$ , and when

15  $\beta$  (reference distance)  $> La_{0ai}$  (4)

calculates current position display information from said current position  $a_i$ , but when

$\beta$  (reference distance)  $\leq La_{0ai}$  (5)

calculates current position display information  
20 from said current position  $a_i$ , and in addition takes said current position  $a_i$  to be the new reference point, and takes the direction from the previous reference point  $a_0$  to the new reference point  $a_i$  to be the new reference direction  $\alpha$ .

25 4. The pedestrian navigation device according to Claim 3, characterized in that said central processing means takes the current position at the start of

navigation to be the reference point  $a_0$ , receives the current position  $a_i$  at prescribed intervals from said position information analysis means, calculates the distance  $La_{0ai}$  between said reference point  $a_0$  and said  
5 current position  $a_i$ , and when

$$\beta \text{ (reference distance)} > La_{0ai} \quad (4)$$

calculates current position display information from said current position  $a_i$ , but when

$$\beta \text{ (reference distance)} \leq La_{0ai} \quad (5)$$

10 calculates current position display information from said current position  $a_i$ , and in addition takes the current position  $a_1$  next calculated after said reference point  $a_0$  to be the new reference point, and takes the direction from the previous reference point  $a_0$  to said  
15 current position  $a_i$  to be the new reference direction  $\alpha$ .

5. A pedestrian navigation device for navigating the route of a pedestrian, comprising:

position information reception means for obtaining current position information;

20 position information analysis means for analyzing said current position information received by the said position information reception means and calculating the current position;

map information storage means for storing map  
25 information;

central processing means for calculating current position display information, based on said current

position calculated by said position information analysis means, and on said map information stored by said map information storage means; and,

display means for displaying said current position  
5 display information calculated by said central processing means; and characterized in that

said central processing means has a reference direction  $\alpha$  indicating the direction of a past movement route and a prescribed tolerance angle  $\gamma$ , takes the  
10 current position at the start of navigation to be reference point  $a_0$ , and, upon receiving the current position  $a_i$  after a prescribed time from said position information analysis means, calculates the direction  $a_0 \rightarrow a_i$  from said reference point  $a_0$  to said current  
15 position  $a_i$ , and

(a) if the direction  $a_0 \rightarrow a_i$  is outside the range of the tolerance angle  $\gamma$  from the reference direction  $\alpha$ , uses current position display information calculated using said reference point  $a_0$  without modification; but

20 (b) if the direction  $a_0 \rightarrow a_i$  is within the range of the tolerance angle  $\gamma$  from the reference direction  $\alpha$ , calculates current position display information using said current position  $a_i$ , and moreover takes the corrected position of said current position  $a_i$  to be the  
25 new reference point, and takes the direction from the previous reference point  $a_0$  to the new reference point  $a_i$  to be the new reference direction  $\alpha$ .

6. A pedestrian navigation device for navigating the route of a pedestrian, comprising:

position information reception means for obtaining current position information;

5 position information analysis means for analyzing said current position information received by the said position information reception means and calculating the current position;

map information storage means for storing map  
10 information;

central processing means for calculating current position display information, based on said current position calculated by said position information analysis means, and on said map information stored by  
15 said map information storage means;

display means for displaying said current position display information calculated by said central processing means; and,

direction measurement means for measuring the  
20 direction of advance; and characterized in that

said central processing means takes the current position at the start of navigation to be reference point a0, and upon receiving the current position a1 after a prescribed time from said position information  
25 analysis means, corrects said current position a1 in said direction of advance measured by said direction measurement means and calculates current position

display information, and in addition takes the corrected position of said current position  $a_1$  to be the new reference point.

7. A pedestrian navigation device for navigating  
5 the route of a pedestrian, comprising:

position information reception means for obtaining current position information;

position information analysis means for analyzing said current position information received by the said  
10 position information reception means and calculating the current position;

map information storage means for storing map information;

central processing means for calculating current  
15 position display information, based on said current position calculated by said position information analysis means, and on said map information stored by said map information storage means;

display means for displaying said current position  
20 display information calculated by said central processing means; and,

direction measurement means for measuring the direction of advance; and characterized in that

said central processing means takes the current  
25 position at the start of navigation to be reference point  $a_0$ , and upon receiving the current position  $a_i$  after a prescribed time from said position information



analysis means, calculates the direction  $a_0 \rightarrow a_i$  from said reference point  $a_0$  to said current position  $a_i$ , and

(a) if the direction  $a_0 \rightarrow a_i$  is outside the range of the tolerance angle  $\gamma$  from said direction of advance measured by said direction measurement means, uses  
5 current position display information calculated using said reference point  $a_0$  without modification; but

(b) if the direction  $a_0 \rightarrow a_i$  is within the range of the tolerance angle  $\gamma$  from said direction of advance  
10 measured by said direction measurement means, calculates current position display information using said current position  $a_i$ , and in addition takes the corrected position of said current position  $a_i$  to be the new reference point.

15 8. The pedestrian navigation device according to Claim 6 or Claim 7, characterized in that said direction measurement means is an electronic compass.

9. The pedestrian navigation device according to Claim 6 or Claim 7, characterized in that said direction  
20 measurement means is a gyrosensor.

10. The pedestrian navigation device according to any one of Claims 1 through 7, characterized in that said position information reception means obtains current position information from a GPS (Global  
25 Positioning System).

11. A program for causing a portable terminal to navigate a pedestrian route, which realizes in the

portable terminal the functions of the pedestrian navigation devices according to any one of Claims 1 through 7.